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(54) Perfected radiator.

(57) A radiator (1) presenting two side by side radiator elements (2), each presenting two manifolds (4) and a number of columns (5) hydraulically connecting the manifolds (4) of the same element. The radiator (1) also presents a wall (6) of the manifolds of a first element contacting a corresponding wall (6) of the manifolds of the second element, the contact portion of the walls (6) of the manifolds being defined along a flat portion of the walls; a recess (7) formed in the flat portion of the walls at the ends of each manifold, to define a duct between the side by side manifolds; a weld (8) along the edge of the recesses between the side by side walls, so as to define a single manifold at the ends of each pair of manifolds; and a plate (11) fitted in fluidtight manner to the end of the single manifold.

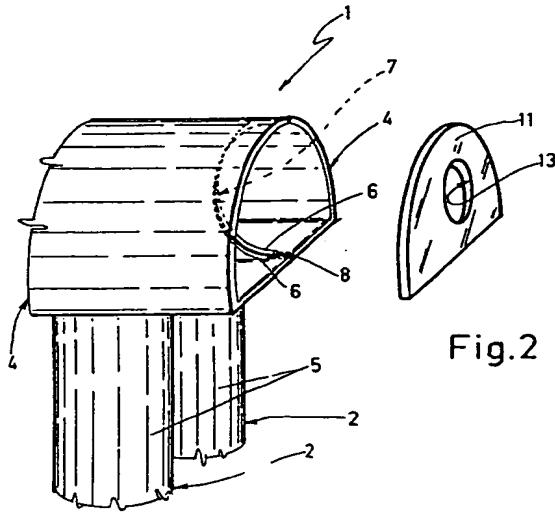


Fig. 2

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The present invention relates to a perfected radiator presenting two radiator elements, each comprising two manifolds connected hydraulically by a number of columns.

Known radiators of the above type present, at each axial end of the manifolds of a first element, a body for externally connecting the manifolds hydraulically to those of the second element. Such a system involves considerable cost, mainly due to the machining required for forming the ducts in the hydraulic connecting bodies, which cost is further increased by the number of seals required.

It is an object of the present invention to provide a perfected radiator featuring an efficient, low-cost system for hydraulically connecting the two radiator elements.

According to the present invention, there is provided a perfected radiator comprising two side by side radiator elements, each presenting two manifolds and a number of columns hydraulically connecting the manifolds of the same radiator element; characterized in that it comprises:

a wall of the manifolds of a first said element contacting a corresponding said wall of the manifolds of the second said element; the contact portion of said walls of the manifolds of said elements being defined along a flat portion of said walls;

a recess formed in said flat portion of said walls, at the axial ends of each said manifold, to define a duct between the side by side manifolds;

a weld formed along the edge of said recesses between said side by side walls, so as to form, at the axial ends of each pair of side by side manifolds, a single manifold, the end of which presents an inner contour defined by the inner contours of said side by side manifolds, and by the front portion of said recesses; and

a plate fitted in fluidtight manner to the end of said single manifold.

A preferred, non-limiting embodiment of the present invention will be described by way of example with reference to the accompanying drawings, in which:

Figure 1 shows a front view of a radiator in accordance with the teachings of the present invention;

Figure 2 shows a larger-scale exploded view of a portion of the Figure 1 radiator;

Figure 3 shows a section of the Figure 2 portion;

Figure 4 shows a side view of the Figure 2 portion with one component removed.

Number 1 in Figure 1 indicates a radiator comprising (Figure 2) two radiator elements 2, each presenting two manifolds 4, and a number of columns 5 hydraulically connecting the manifolds of the same element 2. Elements 2 are arranged side by side so that a wall 6 of manifolds 4 of a first element 2 contacts the corresponding wall 6 of

manifolds 4 of the second element 2; the contact portion of walls 6 of manifolds 4 of the two elements 2 being defined along a flat portion of walls 6.

As shown in Figures 2 to 4, at the axial ends of each manifold 4, a recess 7 is formed, via material removal, in the flat portion of walls 6; and, along the edge of recess 7, a weld 8 is formed between the two side by side walls 6 so as to mechanically connect, and define a duct between, the two side by side manifolds 4. In other words, at the axial ends of each pair of side by side manifolds 4, there is formed a single manifold, the end of which presents an inner contour defined by the inner contours of side by side manifolds 4 and by the front portion of the two recesses 7.

Said end of the single manifold is fitted inside with a plate 11 presenting a peripheral contour substantially similar to the inner contour of the single manifold. More specifically, the outer face of plate 11 is flush with the outer edge of the axial end of the single manifold. The rear portion of recesses 7 is of course unaffected by plate 11 and therefore provides for hydraulically connecting the two side by side manifolds 4. To seal the single manifold, a weld 12 is then made between its inner edge and the peripheral edge of plate 11, which presents a threaded central through hole 13 terminating at the rear portion of recesses 7 and for in-service connection of hydraulic joints and valves.

The advantages of the present invention will be clear from the foregoing description.

In particular, it provides for a two-element radiator featuring a hydraulic connecting system between the manifolds which is both efficient and cheap and easy to produce.

Clearly, changes may be made to radiator 1 as described and illustrated herein without, however, departing from the scope of the present invention.

In particular, manifolds 4 may differ in design from those shown herein, providing manifolds 4 of a first element 2 present a wall 6 contacting a corresponding wall 6 of manifolds 4 of the second element 2 along a flat portion in which to form recesses 7; in which case, of course, the outer contour of plate 11 will substantially match the inner contour of the single manifold formed by the two side by side manifolds 4 of the two elements 2.

Claims

1. A perfected radiator comprising two side by side radiator elements (2), each presenting two manifolds (4) and a number of columns (5) hydraulically connecting the manifolds (4) of the same radiator element (2); characterized in that it comprises:
a wall (6) of the manifolds (4) of a first said

- element (2) contacting a corresponding said wall (6) of the manifolds (4) of the second said element (2); the contact portion of said walls (6) of the manifolds (4) of said elements (2) being defined along a flat portion of said walls (6);
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a recess (7) formed in said flat portion of said walls (6), at the axial ends of each said manifold (4), to define a duct between the side by side manifolds (4);
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a weld (8) formed along the edge of said recesses (7) between said side by side walls (6), so as to form, at the axial ends of each pair of side by side manifolds (4), a single manifold, the end of which presents an inner contour defined by the inner contours of said side by side manifolds (4), and by the front portion of said recesses (7); and
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a plate (11) fitted in fluidtight manner to the end of said single manifold.
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2. A radiator as claimed in Claim 1, characterized in that said plate (11) is fitted inside the end of said single manifold; and the peripheral contour of said plate (11) substantially matches the inner contour of the end of said single manifold.
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3. A radiator as claimed in Claim 2, characterized in that it comprises a weld (12) between the peripheral contour of said plate (11) and the inner contour of the end of said single manifold, for sealing said single manifold.
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4. A radiator as claimed in any one of the foregoing Claims, characterized in that said plate (11) presents a threaded through hole (13) for in-service connection of hydraulic joints and valves.
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5. A radiator as claimed in Claim 4, characterized in that said hole (13) terminates at the rear portion of said recesses (7).
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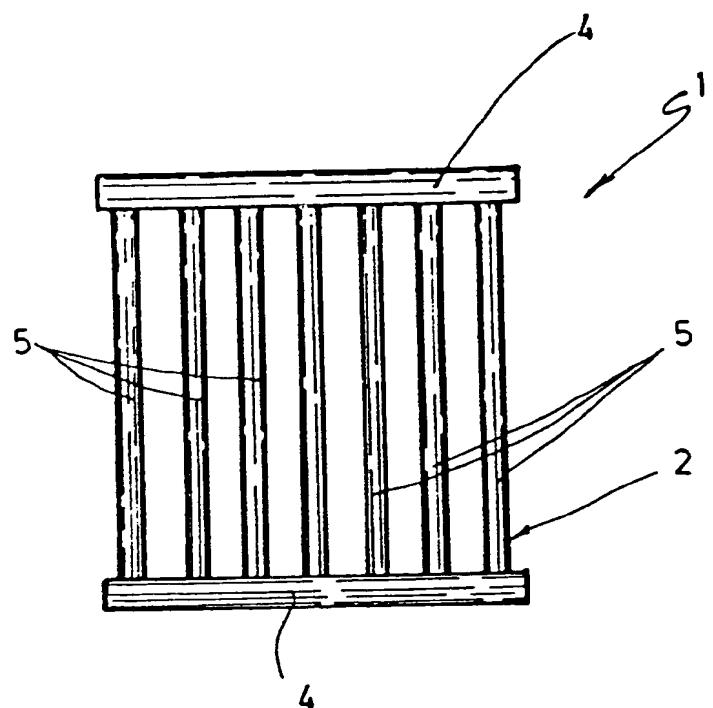


Fig.1

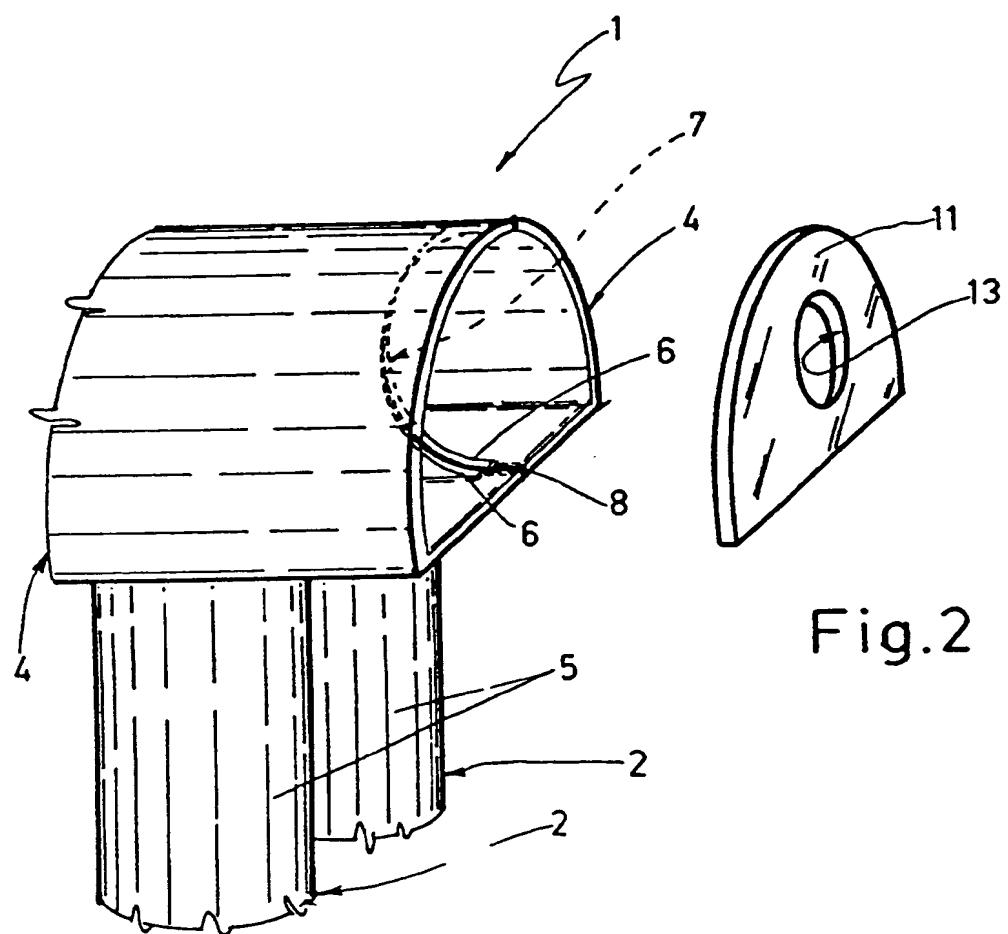


Fig.2

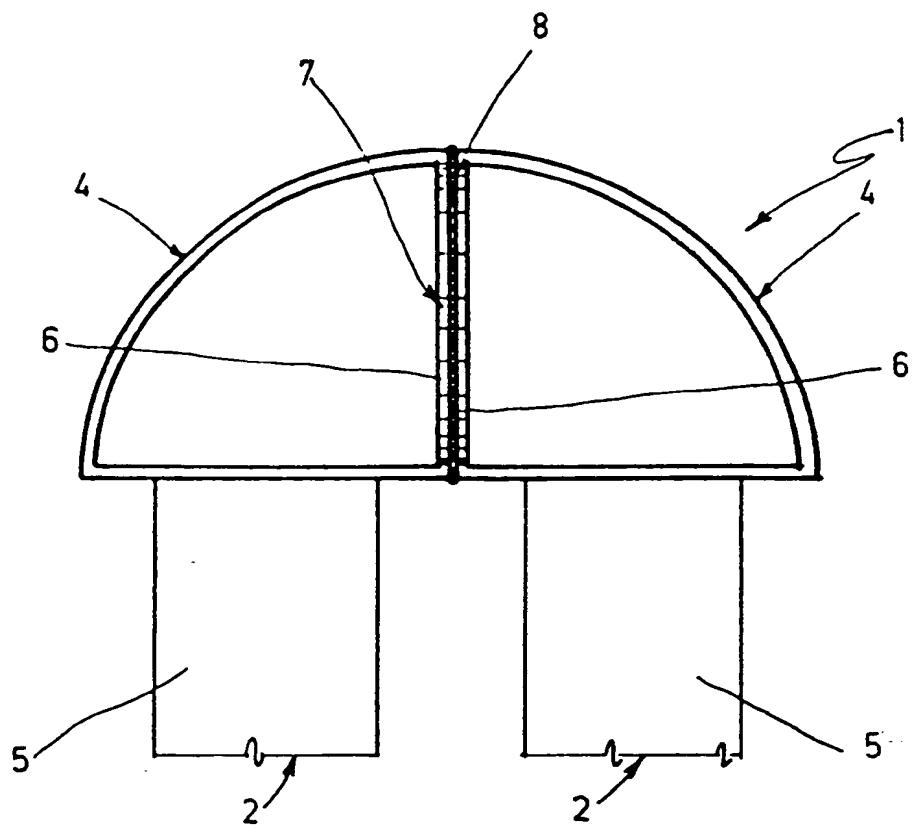


Fig.4

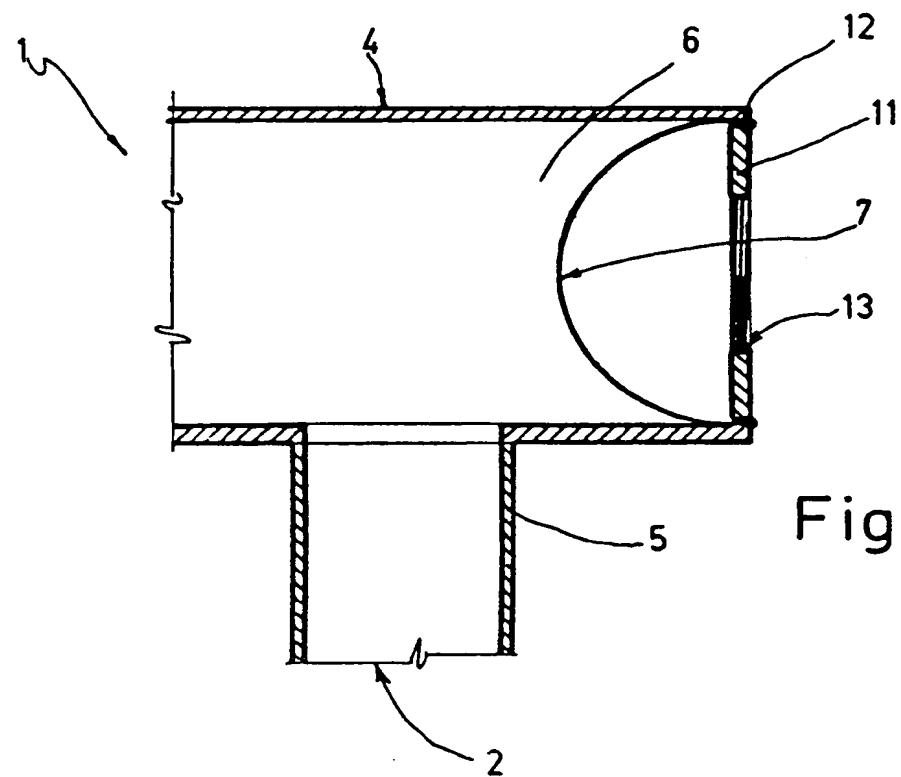


Fig.3



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EUROPEAN SEARCH REPORT

Application Number
EP 95 10 3273

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
Y	FR-A-1 494 592 (S.A. TRAVAIL MÉCANIQUE DE LA TÔLE)	1,2	F28F9/02
A	* page 2, left column, paragraph 8-9; figures 1-11 *	5	F28D1/053
Y	---		
A	US-A-4 019 573 (MODINE) * figure 6 *	1,2 4,5	
A	US-A-3 368 617 (ROSMAN ET AL) * figure 3 *	3	

TECHNICAL FIELDS SEARCHED (Int.Cl.6)			
F28F F28D			
<p>The present search report has been drawn up for all claims</p>			
Place of search	Date of completion of the search	Examiner	
THE HAGUE	24 May 1995	DE SENA, A	
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			